THE MINERAL INDUSTRY OF ITALY

By Harold R. Newman

Italy has ample deposits of industrial minerals but few deposits of other mineral resources. Deposits of coal, iron, metallic minerals, and petroleum are not substantial. Italy was almost entirely dependent on imports to meet its energy needs. The country's heavy reliance on foreign petroleum sources, such as Algeria and Libya, made energy security and diversification of energy sources a top concern. The estimated 226.5 billion cubic meters of natural gas reserves that are located mainly in the Po Valley and offshore in the Adriatic Sea, however, were the fourth largest in the European Union (EU) (U.S. Energy Information Agency, 2005§[1]).

Italy has been a significant processor and consumer of imported raw materials. Regionally, it produced significant amounts of dimension stone, feldspar, marble, and pumice. In terms of world production, the country was a significant producer of cement and crude steel (table 1).

The country is a peninsula in southern Europe that extends into the central Mediterranean Sea northeast of Tunisia. Italy, which includes the islands of Sardinia and Sicily, has a surface area of 301,000 square kilometers (km^2). In 2004, the gross domestic product (GDP) based on purchasing power parity was $1.6 trillion and was the fourth largest in Europe. The GDP per capita was $27,476. The annual inflation rate was 2.3%, and the unemployment rate was 8.5% (International Monetary Fund, 2005§).

Government Policies and Programs

Italy was 1 of the 11 founding members of the European Economic and Monetary Union and was the world's 10th ranked economy in 2004. The Government has traditionally played a dominant role in the economy through regulation of ownership of large industrial and financial companies. Privatization and regulatory reform since 1994 have reduced that presence.

Environmental Issues

Italy was focusing on three main areas of environmental improvement—reducing air and water pollution and strengthening the country's environmental laws. Environmental awareness continued to grow as the effects of climate change, air pollution, and oil spills were manifested in the cities and along the coastline.

The Government outlined its national allocation plan (NAP) for carbon dioxide (CO_2) emissions for the steel sector and allocated steel producers a total of 28.9 million metric tons (Mt) for the first year of emissions trading in 2005. The allocation for the steel sector was expected to rise to about 30 Mt of CO_2 emissions by 2010. The Government must approve the overall NAP before individual plants learn what their allowances will be (Metal Bulletin, 2004b).

Production

Outputs of the mining of such metallic ores as lead, silver, and zinc were not significant. Gold was produced by one company, Sargold Resource Corp., which was located near Cagliaria, Sardinia (table 1).

Industrial mineral production, which included construction materials, was the most important sector with the overall output remaining about the same as that of 2003. Domestic production of natural gas and crude petroleum was about the same as that of 2003.

Private and public companies own facilities for the mining and processing of minerals and mineral products (table 2). Some enterprises were under state control for such economic reasons as to maintain employment.

Commodity Analysis

Metals

Bauxite and Alumina.—Eurallumina S.p.A. was an international joint venture between Comalco Ltd. (56.2%) and Glencore International AG (43.8%) and operated a plant in the Porto Vesme Industrial Area in southwestern Sardinia; the plant produced metallurgical-grade alumina and aluminum hydrate.

Italy's only bauxite producer, Sardabauxiti S.p.A., mined the Olmedo karst bauxite deposit, which is largely boehmitic and contains less than 5% diaspore. The underground mine had a production capacity of 350,000 metric tons per year (t/yr). The bauxite was crushed to about 150 millimeters (mm), and then screened to different sizes of 3 mm, 20 mm, and 50 mm. Grade sorting depended upon chemical composition and granulometers. Most of the bauxite was exported to Europe. S&B Industrial Minerals S.p.A. had exclusive rights for the marketing and sale of the bauxite (Industrial Minerals, 2004a).

Copper.—Società Metalli Marghera S.p.A., which was the leading producer of electrorefined copper in Italy, accounted for more than one-half of Italy's refined copper output. Copper mines in Italy were not significant, and imports of ore were small.

[1]References that include a section mark (§) are found in the Internet References Cited section.

Gold.—Medoro Resources Ltd. announced that it had sold all its Italian assets except Monte Ollasteddi and Miniere di Pestarena to Sargold Resource Corp. The assets included Gold Mines of Sardinia Pty. Ltd., the mining operations at Furtei, the gold property at Osilo, and other properties in the Eastern Paleozoics (Platts, 2004§).

Iron and Steel.—Riva Acciaio S.p.A announced that it would close its blast furnace at the Cornigliano plant at yearend 2004 if the furnace fails to resolve its coke supply problem. Under normal conditions, Cornigliano ran one blast furnace that fed two basic oxygen furnaces with a combined output of 1.2 Mt of crude steel. Cornigliano required about 600,000 t/yr of coke for the 1.2 Mt output. The surge in Chinese demand was creating difficulties in importing coke because coke was being taken off the international market (Metal Bulletin, 2004a).

Riva's Taranto plant had the largest capacity in Europe, but the plant has been forced to operate at well below capacity levels because of coke shortages brought about by local government pressure to restrict operation of its coke batteries. The steelworks received permission to reopen the four coke batteries that had been shut down on environmental grounds. Taranto will reopen the No. 3 battery and the others later. The restructuring work on the Nos. 4, 5, and 6 was to continue until midyear 2005 (Metal Bulletin, 2004c).

Lead and Zinc.—Italy imported most of its requirements for lead and zinc concentrates. Within Italy, the small amount of lead and zinc concentrate production came from mines on the Island of Sardinia.

Glencore International announced that it had decided to close the Imperial Smelter Process (ISP) plant at its Porto Vesme refining complex because of uneconomic technology. Production at the electrolytic plant would be increased. Porto Vesme treated primarily bulk concentrates rather than primary concentrates, a significant portion of which came from Xstrata plc's McArthur River Mine in Australia. The Porto Vesme ISP closure called into question the long-term future of McArthur River. The mine has a very large resource and reserves considered sufficient for 25 years of operation. The deposit, however, is mineralogically complex and requires ultrafine grinding to produce a bulk concentrate. It was uncertain whether the displaced concentrates would be treated at the few remaining ISP plants (Mining Journal, 2004).

Industrial Minerals

Barite.—Societá Mineraria Baritina S.p.A. (SMB) mined barite from two locations in northern Italy. SMB's production capacity was 20,000 t/yr, which was mainly paint- and drilling-grade material. SMB's main markets were Italy and Spain. The use of barites in the powder paint sector was a growing market (Industrial Minerals, 2004c).

Bentonite.—Industria Chimica Carlo Laviosa S.p.A's activities included two facilities at Livorno and one on Sardinia. The bentonite operation on Sardinia serves the cat litter market. Bentonite was mined, processed, packaged, and delivered directly from Sardinia.

Fluorspar.—Italy's fluorspar production took place on Sardinia. Nuova Mineraria Silius S.p.A. mined fluorspar at Silius and processed the ore at its plant in Cagliari. The company produced acidspar, which was used in the aluminum, chemicals, and steel industries. Nuova Mineraria had a program underway to increase production (Industrial Minerals, 2004a).

Gypsum.—Fassa S.r.l.'s gypsum processing plant, which opened in mid-2001, continued burning and processing gypsum extracted from a nearby quarry. The plant was completely automatic from the discharge of raw gypsum to the bagging of the finished product.

Lime.—Unicale S.p.A., which had a capacity of about 500,000 t/yr, was the leading producer of quicklime. Most of the lime production was concentrated in Lombardy (table 2).

Potash.—Production of potash remained suspended in 2004. The main reasons continued to be availability of ground water and the inability to remove waste material and mine water owing to environmental and ecological concerns. On the Island of Sicily, the underground mines that had been operating at Pasquasia, Racalmuto, and Realmonte remained on care and maintenance status.

Pumice and Pumicite.—Pumex S.p.A. was one of the world's major producers of pumice powders. The mineral was extracted and processed on the Island of Lipari, which is the largest of the Aeolian Islands off the northeastern coast of Sicily. Pumex, which had a capacity of about 600,000 t/yr, was Italy's leading pumice producer. The company quarried the Mount Pelato deposit and supplied lightweight aggregates for concrete, grout, and mortar for the construction industry; the aggregate was exported globally (Industrial Minerals, 2004d).

Stone, Dimension.—Marble occurs in many localities from the Italian Alps to Sicily and was quarried at hundreds of operations. The most important geographic area for producing white marble is in the Apuan Alps in Tuscany, particularly near the Town of Carrara. Lombardy, the Po Valley, Puglia, and Verona-Vincenza on the mainland and the Island of Sicily are important colored-marble-producing areas. About one-half of the production was in block form. Other major marble-producing areas include the Valle di Susa, which is located near Turin and Benevento.

Mineral Fuels

Italy was almost entirely dependent on imports to meet its energy needs. The country's heavy reliance on foreign petroleum and natural gas sources, such as Algeria and Libya, made energy security and diversification of energy sources a top concern. Petroleum's share of Italy's primary energy mix has decreased and been replaced by coal and natural gas. By 2008, up to an estimated 50% of energy could be produced by coal-fueled powerplants; 30% by renewable sources of energy, including water power; and 20% by gas-fueled powerplants. The share of crude oil used for generating energy shrank to 37% in 2003 from 45% in 2002. All nuclear powerplants have been closed since 1987 following a national referendum (Alexander's Gas & Oil Connections, 2004a§).

Coal.—A joint-venture project of Kimberly Oil NV, an Australian company, and Heritage Petroleum plc was granted a hydrocarbon exploration license for a 615-km^2 area on southwestern Sardinia. The joint venture has targeted the area as a coal-bed

methane project. Geologically, the permit area contains almost the entire Sulcis Basin, which holds estimated subbituminous coal resources of more than 1 billion metric tons (Gt). This coal-bearing sequence is 150 meters (m) thick and contains up to 13 coal seams with a cumulative coal thickness that ranges from 35 to 40 m. The sequence also contains substantial thicknesses of impure coal and carbonaceous shale that have the potential to generate methane in addition to what may be generated from the coal seams. The probability of an extensively heated groundwater system indicated by hot spring activity in the region was high. This geothermal system may be of sufficient temperature to cause generation of methane and other hydrocarbons (Heritage Petroleum plc, 2004§).

Sardegna Energy Ltd. (a wholly owned subsidiary of Adobe Ventures Inc.) acquired the right to upgrade and operate the Carbosulcis coal mine on Sardinia and to develop and operate an integrated gasification powerplant. The Carbosulcis project consisted of an integrated concession that covers a captive coal mine and a proposed 450 megawatt (MW) powerplant situated in the industrial zone of Porto Vesme. Sardegna planned to modernize the mine with high-performance longwall equipment and to start production of 850,000 t/yr in 2005 or 2006. The integrated gasification combined-cycle powerplant would be constructed on a site located adjacent to the existing port and about 3 kilometers (km) from the mine. The plant would sell power to the Italian grid under a power purchase agreement (CNW Group, 2004§).

Lignite was produced by Ente Nazional l'Energia Electrica's Santa Barbara Mine in Tuscany, which was the only lignite mine in Italy.

Geothermal Energy.—Geothermal energy was produced in the Larderello, the Monte Amiata, and the Travale areas in Tuscany. Exploration that used various geologic techniques was being actively pursued in these areas, and research for power stations that exploit geothermal energy was continuing.

Natural Gas and Petroleum.—Italy was less than 20% self-sufficient in energy. Italy's natural gas reserves were estimated to be 226.5 billion cubic meters and petroleum reserves were estimated to be 622 million barrels. Italy imported 84% of natural gas requirements and 93% of petroleum requirements for domestic consumption. The leading sources of imports of natural gas were Algeria (38%), Russia (32%), and the Netherlands (14%). The leading sources of imports of petroleum were the former Soviet Union (28%), Libya (24%), Saudi Arabia (13%), and Iran (10%) (U.S. Energy Information Administration, 2005§).

The Governments of Italy and Libya inaugurated a new pipeline between their countries. The 540-km West Libyan Gas pipeline will carry about 10 billion cubic meters of gas per year from Mellitah on the western coast of Libya to Gela in Sicily and then on to southern Europe. The project was reported to cost $6.6 billion and was the world's deepest gas pipeline, passing east of Malta at a depth of 1,127 m. Revenues were projected to be $20 billion during a 20-year period (Alexander's Gas & Oil Connections, 2004b§).

Renewable Energy.—Enel S.p.A., which was the leading utility in Italy, signed an agreement with GE Energy to purchase 71 of GE's 1.5 MW wind turbines during 2004 and 2005. This represents a capacity of more than 100 MW. Although GE has been active in Italy's energy sector for more than 80 years, this venture marks the company's entry into the Italian wind power industry. Of the 71 wind turbines, 38 were to be used for the Littigheddu project in Sardinia, which will make this one of the largest single installations of wind turbines in Italy. Five wind turbines were to be used for repowering the existing Collarmele project in Abruzzo. GE's larger and more-efficient machines will replace smaller and older machines. The remaining 28 wind turbines will be assigned to future projects (GE Energy, 2004§).

Outlook

Mining of metallic ores is expected to remain at its low level because of ore depletion and will eventually cease altogether. The metals-processing industry, which is based primarily on imported raw materials, is expected to continue to play an important role in Italy's economy. Italy is expected to remain a large producer of crude steel and a significant producer of secondary aluminum in the EU.

The industrial minerals quarrying industry and preparation plants are expected to remain significant especially in the production of barite, cement, clays, fluorspar, marble, and talc. Italy is expected to continue to be the world's leading producer of feldspar, feldspathic minerals, and pumice.

Although production has been relatively stagnant during the past 5 years, domestic outputs of natural gas, crude petroleum, and petroleum refinery derivatives are expected to grow. Italy will continue to depend on imported coal, gas, and petroleum for most of its energy needs.

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Major Sources of Information

Associazione Mineraria Italiana
Via delle Madonne, 20
00197 Rome, Italy
Ministero dell'Industria del Commercio e dell'Artigianato
Direzione Generale delle Mineire
Via Molise, 2
00184 Rome, Italy

TABLE 1
ITALY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2000	2001	2002[e]	2003[e]	2004[e]
METALS						
Aluminum:						
Alumina, calcined basis[e]		950,000	950,000	925,000	975,000 [r]	950,000
Bauxite[e]	thousand metric tons	300	300	300	300	300
Metal:						
Primary		189,800	187,400	190,000	191,000	195,400 [2]
Secondary		657,500	574,900	590,000	594,000	619,000 [2]
Total		847,300	762,300	780,000	785,000	814,400 [2]
Antimony oxides, gross weight[e, 3]		600	600	500	500	500
Bismuth metal[e]		5	5	5	5	5
Cadmium metal, smelter		284	313	390	22 [3]	--
Copper, metal, refined, all kinds[e]		72,800	35,500	32,400	26,700 [3]	33,600
Gold, mine output, Au content	kilograms	791	503	600	500	100
Iron and steel, metal:						
Pig iron	thousand metric tons	11,219	10,650	9,736 [2]	9,800	10,000
Ferroalloys, electric furnace:						
Ferromanganese		40,000	40,000 [e]	40,000	40,000	40,000
Ferrosilicon[e]		12,000	12,000	12,000	12,000	12,000
Silicomanganese		90,000	80,000 [e]	80,000	80,000	80,000
Silicon metal		5,000	5,978	6,000	6,000	6,000
Other[e]		10,000	10,000	10,000	10,000	10,000
Total		157,000	147,978	148,000	148,000	148,000
Steel, crude	thousand metric tons	26,544	26,483	25,930 [2]	26,832 [r, 2]	15,150 [2]
Lead:[e]						
Mine output, Pb content		2,000	1,000	500	500	500
Metal, refined:						
Primary		75,000	82,000	41,000	16,000	40,000 [2]
Secondary		160,000	121,000	152,000	198,000	162,000 [2]
Total		235,000	203,000	193,000	214,000 [2]	202,000 [2]
Manganese, mine output, Mn content[e]		12,000	1,000	500	500	500
Silver, mine output, Ag content	kilograms	4,000 [e]	3,500 [e]	3,500	3,000	3,000
Zinc, metal, primary		170,300	177,800	175,800 [2]	123,100 [2]	118,000
INDUSTRIAL MINERALS						
Barite[e]		30,000	30,000	30,000	30,000	30,000
Bromine[e]		300	300	300	300	300
Cement, hydraulic	thousand metric tons	39,020	39,885	40,000	40,000	40,000
Clays, crude:[e]						
Bentonite	do.	637 [r]	579 [r]	600	600	600
Refractory excluding kaolinitic earth	do.	700	700	700	700	700
Fuller's earth	do.	25 [r]	20 [r]	20 [r]	10 [r]	10
Kaolin	do.	100	100	100	100	100
Kaolinitic earth	do.	10	10	10	10	10
Diatomite[e]		25,000	25,000	25,000	25,000	25,000
Feldspar[e]	thousand metric tons	2,500	2,500	2,500	2,500	2,500
Fluorspar:[e]						
Acid-grade		50,000	30,000	30,000	30,000	30,000
Metallurgical-grade		15,000	15,000	15,000	15,000	15,000
Total		65,000	45,000	45,000	45,000	45,000
Gypsum[e]	thousand metric tons	1,200	1,200	1,200	1,200	1,200
Lime, hydrated, hydraulic and quicklime[e]	do.	2,500	2,500	2,500	2,200 [r]	2,200
Nitrogen, N content of ammonia	do.	408	434	391 [2]	475 [r, 2]	532 [2]
Perlite[e]		60,000	60,000	60,000	60,000	60,000
Pigments, mineral, iron oxides, natural[e]		500	500	500	500	500
Pumice and related materials:[e]						
Pumice and pumiceous lapilli	thousand metric tons	600	600	600	600	600
Pozzolan	do.	4,000	4,000	4,000	4,000	4,000

See footnotes at end of table.

TABLE 1--Continued
ITALY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2000	2001	2002[e]	2003[e]	2004[e]
INDUSTRIAL MINERALS--Continued						
Salt:[e]						
Marine, crude[4]	thousand metric tons	600	600	600	600	600
Rock and brine	do.	3,200	3,200	3,200	3,200	3,200
Sand and gravel:[e]						
Volcanic sand	do.	100	100	100	100	100
Silica sand	do.	300	300	300	300	300
Other sand and gravel		100,000	100,000	100,000	100,000	100,000
Sodium compounds, n.e.s.:[e]						
Soda ash	thousand metric tons	1,000	100	100	100	100
Sodium sulfate	do.	125	125	125	125	125
Stone:						
Calcareous:						
Alabaster	do.	25	25	25	25	25
Marble in blocks:						
White	do.	100	100	100	100	100
Colored	do.	3,000	3,000	3,000	3,000	3,000
Travertine	do.	2,500	2,500	2,500	2,500	2,500
Other:						
Granite	do.	100	100	100	100	100
Sandstone	do.	1,800	1,800	1,800	1,800	1,800
Slate	do.	100	100	100	100	100
Crushed and broken:[5]						
Dolomite	do.	700	700	700	700	700
Limestone	do.	120,000	120,000	120,000	120,000	120,000
Marl for cement	do.	14,000	14,000	14,000	14,000	14,000
Serpentine	do.	1,500	1,500	1,500	1,500	1,500
Quartz and quartzite	do.	30	30	30	30	30
Sulfur, recovered as elemental, in compounds, byproducts, other sources	do.	693	743	702 [r, 2]	692 [r, 2]	688 [2]
Talc and related materials[e]		140,000	140,000	135,000	135,000	135,000
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bituminous rock, natural[e]		30,000	30,000	25,000	25,000	25,000
Coal:						
Lignite	thousand metric tons	14	10	10	10	10
Subbituminous, Sulcis coal[e]		5	5	5	--	--
Coke, metallurgical	thousand metric tons	5,264	4,829	4,064 [2]	4,500	4,500
Gas, natural[e]	million cubic meters	18,500	16,000 [r]	15,000 [r]	13,000 [r]	12,570 [2]
Natural gas liquids[e]	thousand 42-gallon barrels	350	350	350	350	350
Petroleum:						
Crude	do.	29,240	23,256	28,424 [2]	30,000	30,000
Refinery products:						
Liquefied petroleum gas	do.	27,446	27,000 [e]	27,207 [2]	27,000	27,000
Gasoline	do.	175,576	175,000 [e]	184,280 [2]	175,000	175,000
Naphtha[e]	do.	30,000	30,000	30,983 [2]	30,000	30,000
Jet fuel[e]	do.	36,440	36,000	36,000	36,000	36,000
Kerosene[e]	do.	15,000	15,000	15,000	15,000	15,000
Distillate fuel oil	do.	262,226	262,000 [e]	289,913 [2]	260,000	260,000
Residual fuel oil	do.	100,459	100,000 [e]	105,641 [2]	100,000	100,000
Other	do.	46,137	46,000 [e]	46,000	46,000	46,000
Refinery fuel and losses[e]	do.	1,700	1,700	1,700	1,700	1,700
Total[e]	do.	695,000	693,000	737,000	691,000	691,000

TABLE 1--Continued
ITALY: PRODUCTION OF MINERAL COMMODITIES[1]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. [r]Revised. -- Zero.
[1]Table includes data available through October 2005.
[2]Reported figure.
[3]Antimony content is 83% of gross weight.
[4]Does not include production from Sardinia and Sicily, which was estimated to be 200,000 metric tons per year.
[5]Output of limestone and serpentine for dimension stone is included with "Stone: Crushed and broken." In addition to the commodities listed, a variety of other dimension stone was produced and previously listed, but available general information was inadequate for continued reliable estimates of output levels.

TABLE 2
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2004

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina		Eurallumina S.p.A. (Comalco Ltd., 56.2%, and Glencore AG, 43.8%)	Plant at Portoscuso, Sardinia	1,000
Aluminum		Alcoa Italia S.p.A. (Alcoa Inc., 100%)	Smelters at Porto Vesme, Sardinia, and Fusina, near Venice	188
Asbestos		Amiantifera di Balangero S.p.A.	Mine at Balangero, near Turin	100
Barite		Bariosarda S.p.A. (Ente Mineraria Sarda)	Mines at Barega and Mont 'Ega, Sardinia	100
Do.		Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.		Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto Stefano, and Peppixeddu, Sardina	
Do.		Societá Mineraria Baritina S.p.A	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite		Sardabauxiti S.p.A. (Cogein S.p.A., 40%, Comtec S.p.A., 40%, Icofin Co., 20%)	Mine at Olmedo, Sardinia	350
Bentonite		Industria Chimica Carlo Laviosa S.p.A	Mines and plant on Sardinia Island, and a plant near Pisa	250
Cement		52 companies, of which the largest are:		
		Italcementi Fabbriche Riunite Cemento S.p.A.	18 plants, of which the largest are Calusco, Monselice, and Collefero	15,000
Do.		Buzzi Unicem Group	11 plants, of which Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello are the largest	9,000
Do.		Cementerie del Tirreno S.p.A. (Cementir)	6 plants at Arquasta Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	5,300
Copper:				
Refined		Società Metalli Marghera S.p.A.	Refinery at Porto Marghera	60
Refined, secondary		Europametalli - LMI S.p.A.	Refinery at Fornaci di Barga	24
Do.		Sitindustrie S.p.A.	Refinery at Pieve Vergonte	22
Feldspar		At least 5 companies, of which the largest are:		1,500
		Maffei S.p.A.	Surface mines at Pinzolo and Campiglia	(200)
			Underground mine at Vipiteno	(300)
Do.		Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.		Sabbie Silicee Fossanova S.P.A. (Sasifo)	Surface mine at Fossanova	(30)
Gold	kilograms	Gold Mines of Sardinia Pty. Ltd., 70%, and Progemisa S.p.A., 30%	Furtei Mine near Cagliaria, Sardinia	1,400
Gypsum		Fassa S.r.l.	Plant at Moncalvo, Asti	90
Lead, metal		Glencore AG	Refinery at San Gavino, Sardinia	100
Do.		do.	Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	35
Lignite		Ente Nazional per l'Energia Electrica (ENEL)	Surface mine at Santa Barbara	1,000
Lime		Unicale S.p.A.	Plants in Lombardy region	500
Magnesium, metal		Societa Italiana Magnesio S.p.A. (INDEL)	Plant at Bolzano	8
Marble		A number of companies, of which the largest include:		2,000
		Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	(500)
Do.		Industria dei Marmi Vicentini S.p.A.	do.	(300)
Do.		Figaia S.p.A.	do.	(100)
Nitrogen, N content of ammonia		Hydro Agri S.p.A.	Plant at Ferrara	410
Petroleum:				
Crude		Ente Nazional Idrocarburi (ENI), Government 100%	Oilfields: offshore Sicily, the Adriatic Sea, and onshore in Po River Valley	90
Refined	thousand 42-gallon barrels per day	do.	About 30 refineries	2,000

TABLE 2--Continued
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2004

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Potash ore	Industria Sali Otassici e Affini per Aziono S.p.A.	Underground mines at Corvillo, Pasquasia, Racalmuto, and San Cataldo, in Sicily (closed)	1,300
Do.	Sta Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700
Pumice	Pumex S.p.A.	Quarries, Lipari Island, north of Sicily	600
Do.	Sta Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.)	do.	200
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkahi)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Pontteginori, and Querceto, Tuscany	2,000
Steel	Ilva S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,500)	4,000
Do.	Riva Acciaio S.p.A. (Riva Group)	7 steel plants	7,000
Do.	Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame S.p.A.)	Steel plant at Vicenza	1,000
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and at Orani, Sardinia	120
Do.	Talco Sardegna S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Glencore AG	Plant at Porto Vesme, Sardinia	60
Do.	Pertulosa Sud S.p.A.	Plant at Crotone, Calabria	100